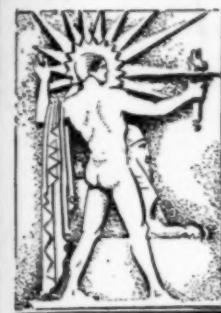


APR 3 1928



# SCIENCE NEWS-LETTER

*The Weekly Summary of Current Science*  
A SCIENCE SERVICE PUBLICATION



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P E R I O D I C A L R O O M  
G E N E R A L L I B R A R Y  
U N I V . O F M I C H .



March 31, 1928



## NOT A NIGHT PICTURE

(See page 194)

Vol. XIII

No. 364



**T**HREE was once a hen who laid an egg. If the hen had not come from a far land and if the egg had not been strange in color, the hen might have cackled, someone might have eaten the egg for breakfast and that would have been the end of the incident.

As it was, a newspaper reporter heard about the egg, a news photographer captured for admiring millions the portrait of the interesting object and the proud producer, and the purely domestic accomplishment became a matter of public note and comment.

It was a fine story. The hen, so the reporter said, laid a green egg. March 17 was approaching. Some readers of the reporter's article may have jumped at the conclusion that the hen was responsive to the feast day. In reality, she was not. She was not even Irish.

The guardians of the hen searching through the tomes in which the habits and peculiarities of such creatures are recorded and preserved noted that that particular sort of hen lays blue eggs. A controversy resulted. Was the scientifically green

reporter or the blue book of science right? Fortunately the egg itself was available. Careful eyes had pronounced it greenish blue or bluish green, according to lights and opinions.

Nevertheless, one believer of science insisted that the egg should be described as blue, as the book had said. The reporter had erred in describing the egg as of a color pleasing to St. Patrick's memory. The scientist who wrote the description was, *jure divino*, right.

And that is the point of this story. Unfortunately, scientists are not infallible. Science, like a timetable, is subject to change without notice. The atom (from the Greek, uncut, indivisible) is composed of electrons whirling around a complex nucleus. Where now are the truths of Aristotle who swayed the intellectual world for two millennia?

Science is not a creed to be worshipped. Scientists are not wisemen and priests who learn rituals. A school boy may find a flaw in a classic of science or discover new truths that perfect some of the handiwork of the pioneers.

**Editorial**

Science News-Letter, March 31, 1928

## Not a Night Picture

*Physics*

Though it looks at first glance to be a picture of snow-covered trees, taken at night time, the cover illustration this week is of vegetation full of green foliage, taken with light vibrating too slowly to be visible to the eye, the so-called infra-red rays. Though the eye cannot detect them, these rays can be focussed through a lens, over which is placed a screen to cut out the more rapid, and visible, rays. Photographic plates can be sensitized so that they record this image, though even at best, and on a bright day, a long time exposure is required.

This photograph was taken by that ingenious American physicist, Prof. Robert Williams Wood, of Johns Hopkins University, in Baltimore. One application that has been made of such methods of photography is to photograph the stars in full daylight. The light from the sky is almost completely deficient in these rays, hence it appears black in the picture. But the stars send out infra-red light, as well as the visible kind, so that if the visible glare from the sky is eliminated by suitable screens, the delicate infrared rays of the stars can be made to write their own records on the sensitive emulsion of the plate.

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Science News-Letter, March 31, 1928

# Modern Presidents Die Young

Medicine



DOLLY MADISON lived to queen it over Washington's society for many years after she departed from the White House

By MARJORIE MACDILL

Presidents die young. And a cold-figured statistician looking at the life of the leading presidential candidates passes the following judgment.

Lowden and Reed, now 66, could expect eleven years of life if they were ordinary men such as those whose records were used in compiling the life tables that determine insurance rates. But if they become president, they face a sacrifice of seven and a half years of life. Such is the average toll that has been levied upon American presidents since the Civil War. Remembering of course that this is a cold statistical evaluation without any consideration of the personal health of these two candidates, it is to be expected that either will just barely live out one term of office if he should be elected president.

Hoover, now 53, Smith, now 54, and Ritchie, now 51, have much brighter outlooks. Expectancy tables grant them 18½, 17½ and 20½ more years of life, respectively, if they dodge the presidential chair. Deducing the sacrificial years in the event that they are elected, all of

these candidates will have plenty of time left to complete two terms if the people are willing. Dawes, now in his 63rd year, can expect 13 years more of life if spared the rigors of the presidency and should, statistics say, finish out a term of office without difficulty if elected.

An investigation conducted by Dr. Louis I. Dublin, statistician of the Metropolitan Life Insurance Company, indicates that the physical wear and tear of being president cuts off a disconcerting number of years from the normal expectancy of life of those elected to the highest office in the gift of the people.

It is upon the basis of his findings that one is able to speculate upon the statistical probabilities of longevity for those who desire to become next president of the United States.

Presidents do not live as long as they did in the early days of the republic.

Eight years and nine months is the average price the twelve men in the chief magistracy of the country, who have died since the Civil War, have had to pay for their high office. If the two men still living who have occupied the office live out their full normal span the figure is only decreased to seven and a half years.

Yet, taken as a whole, the presidents are by no means a short-lived group.

"The average age at death of the twenty-seven presidents who have died is 68.41 years," declared Dr. Dublin, "and our one living ex-president, Chief Justice Taft, is 70. According to the life tables, the twenty-seven deceased presidents would have been expected to live 458.46 years after their inaugurations—they actually lived 373.14 years. The men who become this country's chief magistrates must, in the very nature of things, be a relatively long-lived group; for no one is elected to this highest office in the gift of the people until he has reached middle age, at least. As a matter of fact, the average age of our twenty-nine chief executives, at the time they were inaugurated, was 54.31 years. Theodore Roosevelt, at 42, was the youngest. There were, in all, six, Polk, Pierce, Grant, Garfield, Cleveland and Roosevelt, who were between 40 and 50 when inaugurated. There were eighteen who assumed the of-



JOHN ADAMS, who attained the greatest age of any president thus far. He died at ninety, within an hour of his friend Thomas Jefferson

fice at ages from 50 to 60 years, and five, Buchanan, Taylor, William Henry Harrison, Jackson and John Adams, were between 60 and 70. William Henry Harrison was the oldest, at 68, followed by Buchanan at 65. It was to be expected that this group, made up of twenty-nine men of the highest type, who had lived on the average more than 54 years when they assumed office, would, on the average, survive to very close to the traditional three-score and ten years."

Dividing the presidents into two groups, one beginning with Washington and ending with Buchanan, and the second beginning with Lincoln and ending at the present time, a very different picture is presented from that suggested by Dr. Dublin's composite data on the whole group.

"The average age at death of the fifteen presidents of the earlier, or pre-Civil War era," he explained, "was 73.8 years, whereas that of the twelve deceased presidents of the post-Civil War period was only 61.67 years. It becomes immediately apparent that it is the weight of the longer lives of the earlier chief executives which brings the average age at death for the entire group up to the figure we quoted, namely, 68.41 years. This becomes still more plainly evident when we compare for each president, the number of years actually lived after accession with the number of years he would have been expected to live in accordance with the expectation of life prevailing in his day.

(Turn the page)

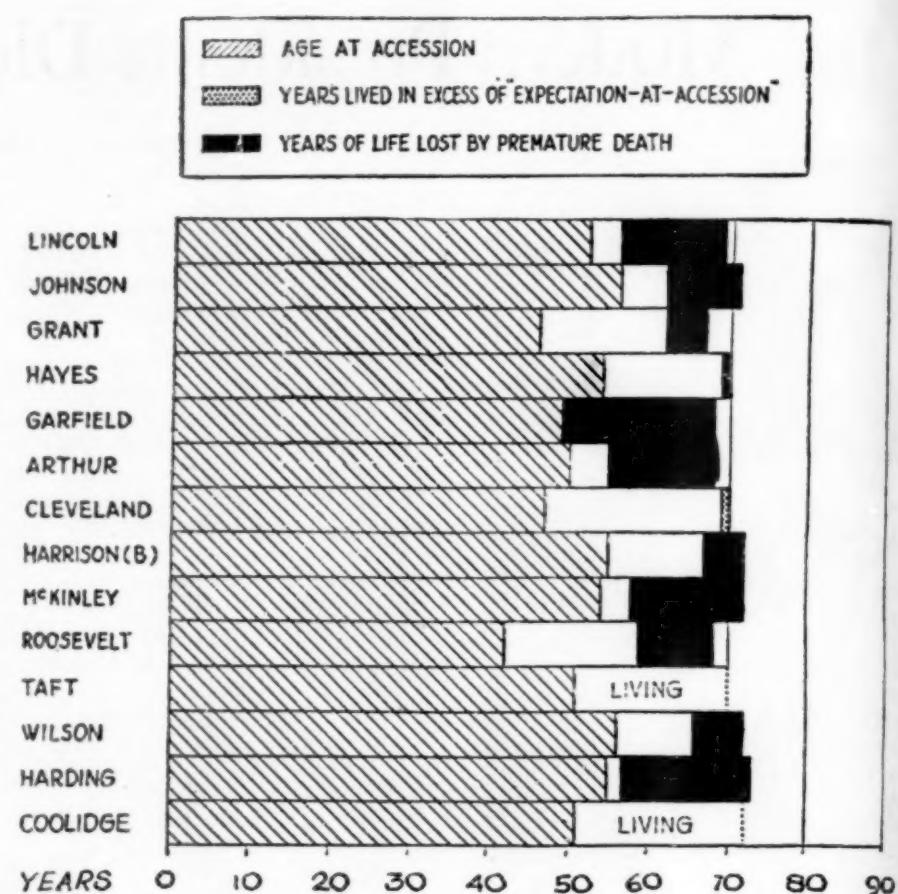
## Presidents—Continued

"In the earlier period, fifteen men were elected, or succeeded to the presidency. As nearly as can be gauged by the aid of the more reliable among the life tables, the combined expectation of life of these fifteen men, when they assumed the office, was 229.65 years. The actual number of years lived by these fifteen chief executives was 250.02, or 20.37 years in excess of the expected. On the average then, these earlier incumbents lived 1.35 years in excess of their expectation of life at their presidential inaugurations.

"Since 1861, we have had fourteen presidents, twelve of whom have died. We find that the combined expectation of life, at accession, of the twelve deceased executives, from Lincoln to Harding, was 228.81 years. These twelve men actually lived, however, only 123.12 years, or 105.69 years less than their normal life expectancy at their ages of accession to the presidency. This group of twelve men, on the average, lived 8.81 years less than their normal expectation when they assumed the office. The combined expectation of life at accession, of the two living men who have filled the office was 40.96 years. If that expectation is fulfilled the number of years lived by the fourteen presidents from Lincoln to Coolidge, after accession, will be 164.08, or still 105.69 years below the expected; and the average life tenure of the fourteen, since they assumed office, would still be 7.55 years below the expected, as compared with 1.35 years above the expected for the fifteen men who were the country's chief magistrates prior to the Civil War.

"Of the fifteen presidents during the era 1789-1861, nine lived to exceed their life expectations at accession; of the twelve deceased presidents since 1861, only a single one, Grover Cleveland, lived beyond his normal expectancy at his inauguration to the presidency: by 1.3 years. Three of the twelve presidents who have died since 1861, Lincoln, Garfield and McKinley, lost their lives through assassination. The presidency has in recent decades been a hazardous occupation; but even had these men lived out their life expectations the post-Civil War presidents would still fall far short of living as long as the life tables allot to men of the ages at which they were inaugurated."

The oldest man to be elected to the presidency has also the record for falling victim the quickest to the demands



A CHART showing the longevity of the 14 Presidents since 1861. The average of the 12 deceased chief executives in this group was nearly nine years below expectation

of his high office. "Old Tippecanoe" Harrison was carried into the White House on the enthusiasm of the famous log cabin and hard cider campaign at the age of 68. That inauguration day was what inauguration days usually are from the point of view of weather. So the old veteran of the Indian warfare of the Northwest Territory caught cold from riding bareheaded in the rain to the Capitol. His conscientious labor trying to satisfy the throngs of office seekers that beset him on every hand, aggravated the cold which turned into pneumonia and terminated fatally when he had only been president a month.

The next oldest president to take office, James Buchanan, incidentally the only president to remain a bachelor throughout his stay in the White House, presents to posterity a pathetic figure. However able he may have been in his prime he is remembered as a weak, vacillating old man, overcome by the magnitude of the events ultimately leading up to the Civil War that he was called upon to face.

On the other hand, Andrew Jackson, another of the older presidents, could hardly be said to be lacking in

firmness and decision in his old age. The old warhorse went into political retirement after leaving office but nevertheless continued to dominate his party from within the walls of his beloved Hermitage until the day of his death at 79.

The very early leaders of our country seem to have been a particularly husky lot. John Adams, who attained the greatest age of any of the men who have been president, lived to over ninety, finally expiring within an hour of Thomas Jefferson, a mere youngster of 83. In spite of their bitter political antagonism these two octogenarians were fast friends in their declining years. Both lived lives of quiet retirement but retained active interest in the affairs of the nation. The letters they exchanged attracted wide attention from the press of two continents and provoked the following rather extraordinary comment from the *London Morning Chronicle*.

"What a contrast the following correspondence of the two rival Presidents of the greatest Republic of the world, reflecting an old age dedicated to virtue, temperance, and philosophy, presents to the heartsickening details, (Turn to page 201)

# Big Dipper a Guide to Constellations

Astronomy

By JAMES STOKLEY

At this time of year, during the spring, it is a good time to commence the study of the constellations. After a winter of more or less bad weather, which kept us indoors at nights, we are now beginning to get out at the same time as the stars. And, also, one of the most conspicuous and best known of all the constellation—the Big Dipper—is now high overhead in its best evening position of the year.

Perhaps better than any other star group is the Big Dipper, also known as the Great Bear, and in England, as Charles' Wain, as a guide to the constellations. Few indeed are the people who do not know it by sight, even though they may be completely ignorant of all the others. And most people know also that the two stars at the bowl of the Dipper, now inverted in the sky, tell the location of the pole star, and are so called the Pointers. As the pole star is always in almost the exact north, it can thus be used as a guide at night.

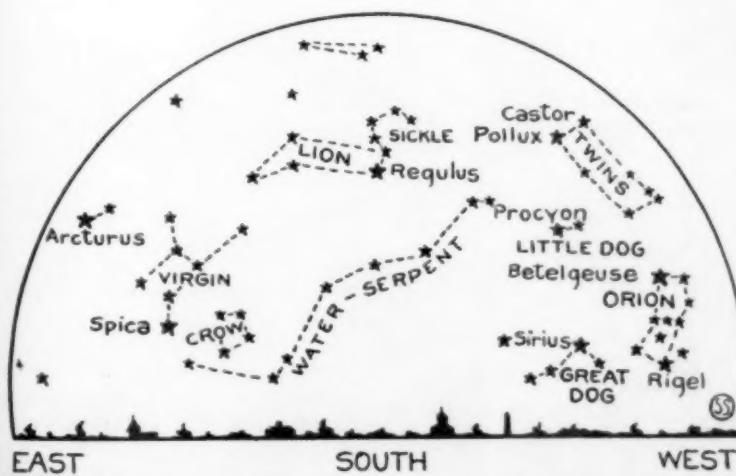
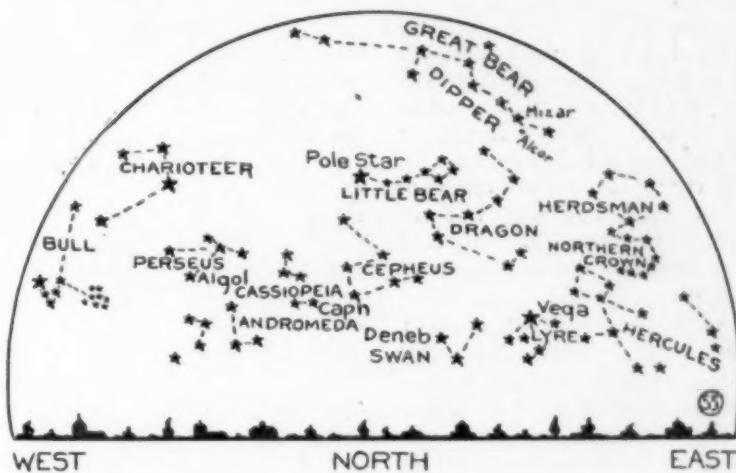
The Big Dipper is interesting in itself. For one thing, there is a test in it for keenness of vision. Look at the handle, which points to the east these evenings. Now look at the star where the handle turns. How many stars do you see there? Almost anybody can see one—the star Mizar. But can you see another and much fainter star just below it? If you can, you see Alcor, or the "rider" as it is sometimes called. Mizar, with its immediate neighbors, Alioth, nearest the bowl of the dipper, and Benetnasch, the one at the end of the handle, and the three horses. Alcor is of the fourth magnitude, ap-

parently well within the limits of naked eye visibility, as it is usually stated that stars as faint as the sixth magnitude can be seen with the naked eye. But, unfortunately for many of us, that refers only to a really dark sky and a clear atmosphere, a condition unattainable in our great cities. From the cities in the eastern part of the country Alcor is often rather difficult to observe. But if Mizar can be seen at all, a pair of opera glasses will reveal Alcor. From such a point of vantage as a high mountain or plateau, as in northern Arizona, for example, a dark night brings out quite a different kind of sky, with such a profusion of stars that even city-dwelling astronomers have had difficulty in recognizing familiar star groups.

The Big Dipper is not the only such implement. There is also the Little Dipper, or the little bear, Ursa Minor, which has the pole star

at the end of the handle. As a bear, the pole star is at the tip of the tail. The map shows the little bear, or dipper, with its seven stars, but here again the lights of the city blot out many of these. Usually all that can be seen under such conditions are the pole star itself, which can be located with the aid of the pointers; and the two stars at the bottom of the dipper, farthest from the pole star. These latter orbs are called the guardians of the pole. Though sometimes above or below, and at other times, as now, to the side of the pole star, these guardians always remain close by it.

The pole star is almost at the north pole of the heavens, but it is not exactly at that point. Anyone with a camera can prove this for himself. Take your camera, set it up after dark on a clear moonless night, so that it points to the pole star. Leave it for several hours, with the shutter open, making a time exposure. Close the shutter before the first break of dawn. When the film is developed, you will find on the negative a series of arcs of circles. There are left by the stars as they apparently cross the sky from east to west. Of course the truth is that the earth itself is turning from west to east, but it turns so smoothly that we are not aware of the motion from our ordinary senses. So as the stars apparently move they leave trails on the camera film. The pole of the heavens is the point directly above the north pole of the earth, and so the stars seem to turn around this point. On your negative of the star trails you will see two rather heavy arcs, due to the pointers. You (Turn the page)



HOLD THIS PAGE in front of you and face north or south on April evenings. The maps then show the position of the stars as they appear to you

## Big Dipper—Continued

will see two smaller ones traced by the guardians. And close to the center of all these circles, you will see a very small arc, which is due to the pole star itself. This shows that the pole star is not right at the pole, even though it is near enough to serve as a convenient guide on a dark night. Really, it is about two and a half times as far from the true pole as an apparent diameter of the full moon. The circle in which it moves, therefore, is about five times as big as the moon appears to us.

The north pole of the heavens is the point directly above the north pole of the earth. Another way of saying this would be that to a person at the north pole the celestial pole would be at an angle of 90 degrees from the horizon. If the person were at the equator, the pole would be on the northern horizon, or at an angle of zero degrees from it. Now, as we measure latitude on the earth, the equator is zero degrees latitude, and the north pole is 90 degrees north latitude. So in order to find the latitude of any place north of the equator, we merely have to measure the height of the pole above the horizon.

This is the way that navigators in the days before the invention of the sextant used to find the latitude of a ship at sea. With an instrument called the astrolabe, the height of a star above the horizon could be measured fairly accurately. But since the pole star is an appreciable distance from the pole, how may the pole be found?

Here is where the guardians of the pole proved useful. The true pole of the heavens is almost on a line drawn from the pole star to the nearest of the two guardians. If the guardians, and the pole star, are at the same height above the horizon, the height of the pole star itself is almost exactly the same as that of the celestial pole. So a ship's master, in the days of Columbus, for example, would not use his astrolabe on the pole star to find his latitude unless the pole star and the guardians were on the same horizontal line, as they are in the evenings at this time of the year.

Another familiar constellation now with us is the sickle, in Leo, the lion, now in the southern evening sky. The brilliant Regulus marks the end of its handle. Arcturus, in Boötes, the herdsman, shines high in the east, while down in the north-

east we see again Vega, in the heavenly lyre. The winter constellations are rapidly departing. Early in the evening we can still see Orion, but he sets soon after the sun. The great dog, with Sirius, the "dog-star," also sets a few hours after the sun, and Procyon, in the little dog, follows not long after. Higher in the western sky are Castor and Pollux, the twins, to remind us still of the winter constellations. With the passing of Jupiter close to the sun this month, he has gone from our view completely for the present, to reappear by the middle of May as a morning star before sunrise. With his departure, we are left, for the first time in months, without a naked eye planet in the evening sky, though Saturn can be seen now in the early morning sky. At 3:40 a. m., it is directly south. Venus is also a morning star now, but it is not very well placed for observation even in these hours.

*Science News-Letter, March 31, 1928*

## A Serpent's Meekness

*Zoology*

E. G. BOULENGER, in *A Naturalist at the Zoo* (Brentano's):

The power of fascination attributed to snakes is non-existent. Many years ago in the late autumn, I remember introducing a mouse into the compartment of a South African house-snake, which I kept in a cage at home. As soon as the mouse entered the cage it went up to the snake, and insisted on nesting in the centre of its coils, pushing at the reptile until they lay in the required position. The snake and the mouse lived in harmony for some weeks, but as the winter approached, the former decided to dig a burrow in which to hibernate, and this it proceeded to do, the mouse being an interested onlooker. The snake, however, on entering the burrow on its completion was not allowed to enjoy its well-earned rest, being turned out by the mouse, who promptly took possession, the unfortunate serpent being forced to construct other winter quarters. On the completion of the second burrow the mouse once more ejected the rightful tenant, and settled down to it, the snake returning to the one which he had been forced to evacuate. With the advent of spring the long-suffering reptile's mind turned to thoughts of food—and possibly revenge, with the result that it made a meal off its companion with which it had lived for nearly six months.

*Science News-Letter, March 31, 1928*

## Poetry in Science

*General Science*

SIR RICHARD GREGORY, in *Nature*:

It is commonly assumed, that devotion to science inhibits all sense of pleasure in emotional expression and that familiarity with the structure and processes of Nature breeds indifference to her charms, and destroys the aesthetic veil which gives her both mystery and beauty. Science and poetry thus seem to most people to be poles apart, yet Coleridge said that he attended Sir Humphry Davy's lectures at the Royal Institution for the purpose of increasing his stock of metaphors, and modern poets might well be inspired by the scientific imagination of Sir William Bragg shown in his insight into the atomic structure of crystals. Though poetry and science represent different attitudes towards Nature, they are not mutually destructive, and may be complementary to each other.

Science does not want a divorce from literature, but closer union with it and a common understanding of the distinctive qualities by which each can contribute to the fullness of life.

When a student of science confesses that he knows little or nothing of classical literature, he does so in a spirit of humility; but classical scholars often seem to be supercilious in their disregard of science. This vestige of social snobbery will no doubt disappear in the course of time, and it will be understood more clearly than it is today that science is as necessary a part of the mental equipment of a cultured man as is classical or modern literature or any other art of expression.

*Science News-Letter, March 31, 1928*

## The Witch Wand

*Physics*

W. J. LEWIS ABBOTT, F. G. S., F. R. A. I., in *Behind the Divining-Rod* (Science Progress, January 1928):

I suppose every water-geologist is continually finding himself upon the heels of the diviner: at least it has been my experience for over thirty-five years. During that period I can safely say that I never knew of a single case in which he located water in a place that would have surprised a hydrologist; on the other hand, in almost every case he has been hopelessly wrong, and has often plunged the dupe into useless and great expense. I have always found that he makes a study (in his own way) of surface features, but is invariably not only ignorant of the elements of geology, but ridicules the idea of that science.

*Science News-Letter, March 31, 1928*

## Encephalitis Treatment

*Medicine*

The treatment of encephalitis by the injection of glucose has awakened considerable interest among specialists at St. Elizabeth's Hospital for the Insane. Dr. Walter Freeman, who has made many researches on encephalitis, declared today "that even though the way in which it works is uncertain, this mode of treatment undoubtedly offers something of importance in the treatment of nervous diseases."

The improvement of acute cases of "sleepy sickness" by glucose injections was recently announced by Dr. Leland B. Alford of St. Louis, Mo. The action of the glucose is not well understood but it is believed that the compound exerts a protective action on the nervous system.

The first clue to the beneficial action of glucose, according to Dr. Alford, came from its administration as nourishment to an encephalitis patient who was delirious and refused food. This took place in November, 1926. To the surprise of everyone the patient began to improve. On Christmas day she recovered her senses and by New Year's Day returned home and has remained well ever since. Glucose seemed the most probable factor in this unprecedented recovery and so was given a trial in another acute case which likewise registered rapid improvement.

The method was followed up with good results in as many as forty acute cases. The injections have no harmful effects, it was stated. It has, however, brought about only slight improvement in chronic cases. The chronic form of encephalitis is particularly stubborn and to date few ways have been found of combating it.

It will be many years, Dr. Freeman pointed out, before the glucose treatment can be properly evaluated but, he added, any method that gives hope of relief in dealing with this unfortunate disease, is worthy of trial and further research.

*Science News-Letter, March 31, 1928*

## Planes Fight Locusts

*Entomology*

Locusts, one of the causes of the famines that periodically threaten the great grain-raising plains of Russia, are being fought with the latest means of chemical warfare from the air. During 1927, Soviet agricultural officials report, nearly 77,000 acres of agricultural lands were sprayed with chemicals from airplanes, as compared with only 2,700 acres in 1925.

*Science News-Letter, March 31, 1928*

## Reverser of the Love Philtre

*Biochemistry*



SOPHIA SATINA

Ancient alchemists used to vend to lovesick swains and yearning damsels vials of fluid guaranteed to rouse interest in an unresponsive party of the second part. With the passing of the Age of Romance the love philtre business has fallen off pretty badly; yet even in this Twentieth Century of cold science there is interest in amatory subjects for the alchemist's successor. We no longer try to promote courtship with chemistry, but the chemist can do something toward the understanding of its physiological background.

Miss Sophia Satina is the leading exponent on this continent of a method of studying the chemistry of sex first described by Manoilov. In her hands the technique has been developed to a delicacy not rivalled even by the Russian scientist himself. By means of this test it is possible not only to learn the sex of an animal or plant from an analysis of a small sample of its blood or sap, but also the sex of those humble beings so far down on the evolutionary ladder that they do not betray their gender by either form or activity. It all ties up with the fact that masculine metabolism is more active than feminine, resulting in a more rapid formation of acid in the masculine body fluid. "For the female of the species is sweeter than the male." The technique by which this reaction is studied is somewhat complicated and of almost unbelievable delicacy, and it is to be hoped that Miss Satina, mistress of this craft, may be able to continue her researches for a long time to come.

Sophia Satina was born in Russia, and received her scientific education in Moscow. She also taught in the university there for a number of years, ending her connection in 1921. Since 1923 she has been carrying on her work at the station for experimental evolution of the Carnegie Institution of Washington, at Cold Springs Harbor, L. I., N. Y.

*Science News-Letter, March 31, 1928*

## "Perfect" Diet Gives Vitamin Clue

*Physiological Chemistry*

The day when we shall live on synthetic concentrated pills of food is yet far distant. Yet science's latest attempts to raise laboratory animals on an artificially devised diet of pure foods, have led to the discovery of the new vitamin F, recently announced by Dr. Herbert M. Evans of the University of California.

When a diet of purified food elements consisting of casein, recrystallized cane sugar, certain necessary salts and the five recognized vitamins, A, B, C, D and E, were fed to rats in the laboratories of the department of anatomy, the animals failed to reach more than half size. Theoretically this diet contained all the elements necessary for the health and happiness of rats, but actually something else was necessary. Growth stopped altogether and the animals remained sexually immature. Natural

food had to be resorted to, to supplement what might be called a chemically pure menu in order to reawaken their growth and convert them into healthy adult animals.

"Among the natural foods, lettuce and liver were the most potent," declared Dr. Evans, "and they, therefore, almost certainly contain a new sixth member of the vitamins, to which designation F will be given."

Lettuce when heated and dried failed to give the good results of the fresh product, the investigation showed.

Dr. Evans has to his credit also the discovery of vitamin E, at one time known as vitamin X, a lack of which brings about sterility. Oil from the germ of the wheat grain is thus far the most potent source of this necessary food factor.

*Science News-Letter, March 31, 1928*

# Evolution: Possibilities and Difficulties

*Evolution*

T. H. MORGAN, in *What is Darwinism?* (Yale Review, April, 1928):

It has not been shown that the diagnostic differences used to separate species are differences having a survival value in the surroundings peculiar to each, or to different conditions in the same environment. Here, in fact, is the crux of the argument in so far as it applies to the species question. Its significance was insufficiently realized at first, but the difficulty has become more and more magnified until today we find that a re-examination of the evidence is imperative.

As has been stated, natural selection, if it works, is clearly a theory to explain the manifold adaptations not only of the organism to the outer world but even of the internal parts to each other—for only a system whose parts work well together could persist. Admitting the general argument that adaptations might be accounted for in this way, leaving the origin of species out of the question for the moment, it would still remain to be shown that the differences that distinguish individuals from each other within the species suffice to produce something new. Here, too, we have found by an appeal to fact that there are serious difficulties that were not appreciated by Darwin, because he did not have the necessary evidence to support his assumption.

A few examples will suffice to illustrate some of the questions that must be answered with regard to the survival value of the differences that distinguish related species before the premises of the argument can be admitted.

If any particular character, such as size or color, is measured in a large number of individuals of a race or species, it is found to vary. Some of the individuals will be smaller or fainter in color; others, larger or darker; but the great majority will be average or middle class. If the smaller individuals are destroyed and the larger ones become the parents of the next generation, the resulting population will again show a wide range of variability, but the middle class will be a little taller than was that class in the parental population. Suppose again in the next generation, the smaller individuals are destroyed and only the larger ones left to breed. The same result fol-

lows, and the average may again be somewhat larger. Experience has shown, in fact, that the average population may in most cases be changed by eliminating consistently certain kinds of individuals through a few generations. But then the process slows down rather quickly and soon comes to an end. Further selection fails to produce further change. The upshot has been not to produce a new race in which all the individuals are taller than the tallest of the original race, but only a race in which the average individual has become taller. The tallest may be no taller than before. This fact was not known to Darwin, or at least, if vaguely known, it was not given due weight.

\* \* \* \* \*

There are other difficulties for the mutation theory that are still under discussion and are not to be pre-judged without further work. For example, most of the new types are less vigorous than the wild types from which they come; many of them are defective and could not possibly survive in open competition; others differ so far from the original types in one or another character as to upset the nice adjustment of the parts that is so essential to the life of the individual. Such mutants often give the impression of downward rather than upward evolution. These are difficulties that the mutation theory must meet, but it would be rash to reject the evidence because of these considerations.

We must remember, in the first place, that animals and plants are already so adjusted to the manifold conditions of their existence that almost any haphazard change will be deleterious. If this be generalized, it might be used equally as an argument against all theories of change—that is, against any theory of evolution. There is, however, a way out of this apparent *impasse*. The external conditions may change and the organism will then be maladjusted, and unless it can make a new adjustment it will perish. Again, at the boundaries of its usual range, new variants may be able to adjust themselves to the different conditions that there exist. Furthermore, there may occur at times physiological changes that are an improve-

ment, such as an increase in fertility, or in hardihood, or in time of reaching maturity, and so on. These changes would be difficult to detect, and as yet the mutationists have paid too little attention to them. There is, however, every reason to conclude from what we know even now concerning the scattering of the mutation process that such changes may occur.

In a word, the arguments just reviewed by no means close the door of hope to the modern student of evolution by mutation. The important matter is not that he has a new talking point but that he has new material which he can hope to put to a real test, abiding by the outcome. We must also remember that the majority of mutants that we find are not new, but have probably been rejected many times by natural selection, for some of the same mutants appear over and over again in our cultures. New ones, too, are continually appearing—new in the sense that we have never seen them before. These, too, have no doubt occurred elsewhere. Perhaps the best argument in favor of the view that mutant changes have furnished the material for evolution is the discovery that whenever single hereditary differences are found between wild types, they follow the same laws of heredity as do the newly discovered mutant types.

Quite aside from these technical problems, a wider issue is sometimes raised when evolution is interpreted as the outcome of mechanistic principles, and natural selection as dependent on *chance* variations. To those who are not biologists, and even to some biologists, it seems inconceivable that such a complex machine—even admitting for the moment that the organism works like a machine—could have been brought into existence without relation to the purpose that it fulfills. This seems to them as inconceivable as it would be to suppose that a watch could have come into existence by the chance meeting of pieces of metal, and since everyone knows that watches were not made in this way but that the parts were assembled with the end in view, that is, with a purpose, it is argued that the infinitely more complex organism could not have come about by chance. It is (*Continued on page 202*)

## Presidents—Continued

occasionally disclosed to us, of the miserable beings who fill the thrones of the continent. There is not, perhaps, one sovereign of the continent, who in any sense of the word can be said to honor our nature, while many make us ashamed of it."

John Quincy Adams, the distinguished son of a famous father, was a member of Congress for 16 years after he retired from the presidency. At eighty he suffered a stroke of paralysis at his desk in the House of Representatives and was carried unconscious to the Speaker's room. There he spoke his last words, the famous sentence: "This is the end of the earth. I am content." Thus he maintained even in death his justly conferred nickname, "Old Man Eloquent."

Though there are more ex-presidents' wives than there are ex-presidents living, the first ladies of the land, taken collectively have not been as long lived as their lords. Anna Symmes Harrison, wife of William Henry Harrison, who died a month after he was inaugurated, the shortest term served by any president, holds the record for longevity to date. She died at the venerable age of eighty-nine. Gentle and quiet Lucretia Garfield survived her husband's assassination for many years, finally dying in 1918 at the advanced age of 85. These are exceptions, however, for not many first ladies of the last few decades have rounded out the traditional three score years and ten.

The sprightly Dolly Madison lived to a ripe old age, regal and charming as in the days of her prime. Washington will probably continue to point out for many years to come the spots where the famous belle took up her residence in the turbulent times following the burning of the White House by the British. From the time that she relinquished her sway over the Executive Mansion until her death at 77, she kept Washington society more or less under her dainty thumb.

For many years it was the proper thing for all the foreign diplomats, statesmen and celebrities to stop at her house on H Street, now a part of the Cosmos Club, immediately after calling at the White House.

Until the day of her death she appeared on all state occasions in clothes of the style that prevailed in the heyday of her fame, a full skirt, generally black velvet, gathered on a short waist that open down



DR. LOUIS I. DUBLIN, whose figures have revealed that presidents don't live as long as they used to

the front over soft white tulle . . . and a turban wound around her independent and charming head. The turbans were famous as were the little slippers imported from Paris that scandalized the more democratic citizens of the new republic who could not forget that Mistress Dolly had originally been a Quaker. She was a dominant figure at the young capital for nearly forty years, passing away eventually in 1849.

The actual number of the whole group of presidents, twenty-nine in all, is too small to use as the basis for absolute statements. Nevertheless the facts are so clear-cut as to make it fairly obvious that the modern demands of the office of chief executive have shortened the lives of our latter day presidents. What shall we do with out ex-presidents, the problem that arises after every inauguration, has in recent years been somewhat summarily solved by death, though running for re-election seems to have been the favorite solution of the past.

The physical breakdowns of former presidents Wilson and Harding are too recent to be enlarged upon here. The untimely demise of the energetic Colonel Roosevelt affords striking contrast to the peaceful survival of placid and genial Chief Justice Taft. There are several items, however, that Dr. Dublin points out, that preclude the unreserved conclusion that it was solely the strains and dangers of the chief magistracy which shortened the lives of these men.

"Who shall say," he explained, "whether the men of the pre-Civil War period were, or were not, the sturdier group? Ability to pass a physical test has never been a prerequisite of the presidency—and if it had been, the exactitude of the more modern physical examination would have shown impairments, if any, during recent decades, which would have gone undetected even a half century ago, to say nothing of the earliest days of United States history. It may be that the earlier presidents withstood better the physical stresses of the office because they were stronger men; and that they survived the presidency longer, not because the office from 1789 to the Civil War entailed less mental stress than it now does, but because the presidents themselves were better able to withstand the demands of the chief magistracy on account of their greater vitality. Again, it would be difficult to adduce absolute proof that the shorter life spans of our post-Civil War presidents are properly chargeable solely to the great and growing demands of the office itself upon the vitality of the incumbents. Practically every president was in 'politics' for more or less time preceding his election as chief magistrate. The physical and mental strain of other offices which our presidents have filled—governorships, governor-generalships, vice-presidencies, senatorships, and Cabinet posts—may have had much to do with shortening their lives.

"But even when due allowance is made for these conditioning items, there is still unmistakable evidence that the earlier group lived considerably longer, on the average, after becoming president, than men of their day would be expected to live, whereas the later group died, on the average nearly nine years earlier than men of their day would be expected to die. This is a very sharp contrast—so sharp, indeed, that it cannot be entirely explained away by the presumption of better physical equipment of the early presidents. The change has taken place, moreover, during a period when medical and sanitary science has been making pronounced advances, when the life expectation of the population in general has been increasing, and when influences operating for the prolongation of human life have been far more numerous and more effective than those tending toward its curtailment."

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## The Porcupine

*Zoology*

JAMES J. MONTAGUE, in the New York *Herald-Tribune*:

The porcupine can see no good  
In other creatures of the wood.

When sniff or call or foot he hears,  
He makes himself a ball of spears

With which to jab them if they seek  
In common friendliness to speak.

No pals has he among the brutes  
Which follow various pursuits

To make an honest livelihood  
Along the trails that thread the wood.

No other creatures care to know  
A varmint which distrusts them so;

He will not pass the time of day  
Or greet them in a kindly way,

But nurses sinister designs  
To stick their noses with his spines.

Yet rabbits, which are friendly folk  
And wear no rough and spiny cloak,

Are often on the bill of fare  
In many a wolf's and fox's lair.

And squirrels, whose hearts are full  
of cheer,  
But briefly tarry on this sphere.

Though he is full of hate and spite,  
Perhaps the porcupine is right!

*Science News-Letter, March 31, 1928*

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## Evolution—Continued

implied that, even if the materials existed independently of each other, no imagined series of happy accidents could have brought them together. Hence, not chance variation, but design, must have ruled the evolutionary process, just as purpose has brought about the construction of the watch. It is Paley's old argument scarcely disguised.

Today we are a little more careful in the use of the word *chance*, and somewhat skeptical about the other word, *purpose*, when transferred from its human meaning to events outside of man's activities. If *chance* has any status in science, it means that we do not know what special set of conditions causes a particular event to be realized. A game of chance is one in which a complex series of changes is involved in each new deal—all possible deals might be computed but no particular one could be predicted without a knowledge of a complex set of physical events. On the other hand, the word *purpose*, as we commonly use it, means, in general, that we bring about a particular series of events with the end in view. In a word, we control the happening so that a watch or a locomotive emerges. We can do this because we are familiar both with the desired result and with the combination of parts that will give that result. But is it not hazardous to insist because we make watches in this way, that this is the only way in which contrivances can come about? It may be conceded that when Paley wrote, it may have been difficult at best to suggest how organisms might have evolved by natural process, but at the present time we can at least suggest how this might happen without invoking ultra-scientific agencies. It suffices to show such a possibility to meet his argument on its own grounds, but while this may relieve the biologist of the burden of proof, he will not be satisfied to leave the matter there but will continue to press forward in his endeavor to obtain experimental evidence that evolution may be explained without going beyond the facts furnished by living animals.

*Science News-Letter, March 31, 1928*

Although only three to five per cent. of the cotton boll weevils live through the winter's cold, there are enough hardy survivors in the spring to keep cotton growers perpetually worried.

# CLASSICS OF SCIENCE:

## Helmholtz on Harmonizing Music *Physics*

Helmholtz here describes a number of interesting experiments which you can duplicate on the strings of a grand piano or a violin, or even with fine wire or catgut stretched tightly between clamps. The lecture quoted below is the author's own abridgement of his book: *ON THE SENSATIONS OF TONE AS A PHYSIOLOGICAL BASIS FOR THE THEORY OF MUSIC*.

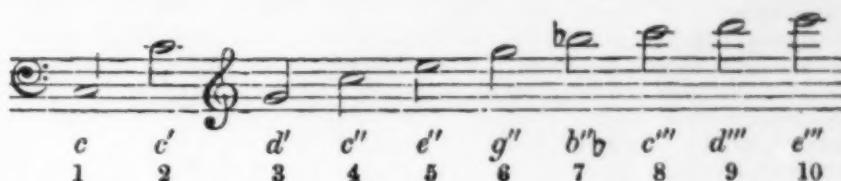
**POPULAR LECTURES ON SCIENTIFIC SUBJECTS:** *On the Physiological Causes of Harmony in Music (1857)*, by H. Helmholtz, translated by E. Atkinson, Ph.D. F.C.S. London, 1873.

### Sympathetic Vibration

You will have observed the phenomena of the sympathetic production of tones in musical instruments, especially stringed instruments. The string of a pianoforte when the damper is raised begins to vibrate as soon as its proper tone is produced in its neighbourhood with sufficient force by some other means. When this foreign tone ceases the tone of the string will be heard to continue some little time longer. If we put little paper riders on the string they will be jerked off when its tone is thus produced in the neighbourhood. This sympathetic action of the string depends on the impact of the vibrating particles of air against the string and its sounding-board.

Each *separate* wave-crest (or condensation) of air which passes by the string is, of course, too weak to produce a sensible motion in it. But when a long series of wave-crests (or condensations) strike the string in such a manner that each succeeding one increases the slight tremour which resulted from the action of its predecessors, the effect finally becomes sensible. It is a process of exactly the same nature as the swinging of a heavy bell. A powerful man can scarcely move it sensibly by a single impulse. A boy, by pulling the rope at regular intervals corresponding to the time of its oscillations, can gradually bring it into violent motion.

This peculiar reinforcement of vibration depends entirely on the rhythmical application of the impulse. When the bell has been once made to vibrate as a pendulum in a very small arc, and the boy always pulls the rope as it falls, and at a time that his pull augments the existing velocity of the bell, this velocity, increasing slightly at each pull, will gradually become considerable. But if the boy apply his power at irregular intervals, sometimes increasing and



"The series of tones which . . . combine with a given fundamental tone, is perfectly determinate. They are tones which perform twice, thrice, four times, etc., as many vibrations in a second as the fundamental tone. They are called the upper partials, or harmonic overtones, of the fundamental tone. If this last be *c*, the series may be written (as above) in musical notation [it being understood that, on account of the temperament of a piano, these are not precisely the fundamental tones of the corresponding strings on that instrument, and that in particular the upper partial, *b*, is necessarily much flatter than the fundamental tone of the corresponding note on the piano]."—Helmholtz.

sometimes diminishing the motion of the bell, he will produce no sensible effect.

In the same way that a mere boy is thus enabled to swing a heavy bell, the tremours of light and mobile air suffice to set in motion the heavy and solid mass of steel contained in a tuning-fork, provided that the tone which is excited in the air is exactly in unison with that of the fork, because in this case also every impact of a wave of air against the fork increases the motions excited by the like previous blows. . . .

Now, then, if several tones are sounded in the neighbourhood of a pianoforte, no string can be set in sympathetic vibration unless it is in unison with one of those tones. For example, depress the forte pedal (thus raising the dampers), and put paper riders on all the strings. They will of course leap off when their strings are put in vibration. Then let several voices or instruments sound tones in the neighbourhood. All those riders, and *only* those, will leap off which are placed upon strings that correspond to tones of the same pitch as those sounded. You perceive that a pianoforte is also capable of analysing the wave confusion of the air into its elementary constituents.

### How We Hear

The process which actually goes on in our ear is probably very like that just described. Deep in the petrous bone out of which the internal ear is hollowed, lies a peculiar organ, the cochlea or snail shell—a cavity filled with water, and so called from its resemblance to the shell of a common garden snail. This spiral passage is divided throughout its length into three sections, upper, middle, and lower, by two membranes stretched in the middle of its height. The

Marchese Corti discovered some very remarkable formations in the middle section. They consist of innumerable plates, microscopically small, and arranged orderly side by side, like the keys of a piano. They are connected at one end with the fibres of the auditory nerve, and at the other with the stretched membrane. . . .

In the so-called vestibulum, also, where the nerves expand upon little membranous bags swimming in water, elastic appendages, similar to stiff hairs, have been lately discovered at the ends of the nerves. The anatomical arrangement of these appendages leaves scarcely any room to doubt that they are set into sympathetic vibration by the waves of sound which are conducted through the ear. Now if we venture to conjecture—it is at present only a conjecture, but after careful consideration I am led to think it very probable—that every such appendage is tuned to a certain tone like the strings of a piano, then the recent experiment with a piano shows you that when (and only when) that tone is sounded the corresponding hair-like appendage may vibrate, and the corresponding nerve-fibre experience a sensation, so that the presence of each single such tone in the midst of a whole confusion of tones must be indicated by the corresponding sensation.

Experience then shows us that the ear really possesses the power of analysing waves of air into their elementary forms.

By compound motions of the air, we have hitherto meant such as have been caused by the simultaneous vibration of several elastic bodies. Now, since the forms of the waves of sound of different musical instruments are different, there is room to suppose that the kind of vi- (Turn the page)

## Harmony—Continued

bration excited in the passages of the ear by one such tone will be exactly the same as the kind of vibration which in another case is there excited by two or more instruments sounded together. If the ear analyses the motion into its elements in the latter case, it cannot well avoid doing so in the former, where the tone is due to a single source. And this is found to be really the case.

I have previously mentioned the form of wave with gently rounded crests and hollows, and termed it simple or pure. In reference to this form the French mathematician Fourier has established a celebrated and important theorem which may be translated from mathematical into ordinary language, thus: *Any form of wave whatever can be compounded of a number of simple waves of different lengths.* The longest of these simple waves has the same length as that of the given form of wave, the others have lengths one-half, one-third, one-fourth, &c. as great.

By the different modes of uniting the crests and hollows of these simple waves, an endless multiplicity of wave-forms may be produced. . . .

### Ear Analyzes Waves

Not only strings, but almost all kinds of musical instruments, produce waves of sound which are more or less different from those of simple tones, and are therefore capable of being compounded out of a greater or less number of simple waves. The ear analyses them all by means of Fourier's theorem better than the best mathematician, and on paying sufficient attention can distinguish the separate simple tones due to the corresponding simple waves. This corresponds precisely to our theory of the sympathetic vibration of the organs described by Corti. Experiments with the piano, as well as the mathematical theory of sympathetic vibrations, show that any upper partials which may be present will also produce sympathetic vibrations. It follows, therefore, that in the cochlea of the ear, every external tone will set in sympathetic vibration, not merely the little plates with their accompanying nerve-fibres, corresponding to its fundamental tone, but also those corresponding to all the upper partials, and that consequently the latter must be heard as well as the former.

Hence a simple tone is one excited by a succession of simple wave-forms. All other wave-forms, such as those produced by the greater number of

musical instruments, excite sensations of a variety of simple tones.

Consequently, all the tones of musical instruments must in strict language, so far as the sensation of musical tone is concerned, be regarded as chords with a predominant fundamental tone.

The whole of this theory of upper partials or harmonic overtones will perhaps seem new and singular. Probably few or none of those present, however frequently they may have heard or performed music, and however fine may be their musical ear, have hitherto perceived the existence of any such tones, although, according to my representations, they must be always and continuously present. In fact, a peculiar act of attention is requisite in order to hear them, and unless we know how to perform this act, the tones remain concealed. As you are aware, no perceptions obtained by the senses are merely sensations impressed on our nervous systems. A peculiar intellectual activity is required to pass from a nervous sensation to the conception of an external object, which the sensation has aroused. The sensations of our nerves of sense are mere symbols indicating certain external objects, and it is usually only after considerable practice that we acquire the power of drawing correct conclusions from our sensations respecting the corresponding objects.

Now it is a universal law of the perceptions obtained through the senses, that we pay only so much attention to the sensations actually experienced, as is sufficient for us to recognise external objects. In this respect we are very onesided and inconsiderate partisans of practical utility; far more so indeed than we suspect. All sensations which have no direct reference to external objects, we are accustomed, as a matter of course, entirely to ignore, and we do not become aware of them till we make a scientific investigation of the action of the senses, or have our attention directed by illness to the phenomena of our own bodies. Thus we often find patients, when suffering under a slight inflammation of the eyes, become for the first time aware of those beads and fibres known as *mouches volantes* swimming about within the vitreous humour of the eye, and then they often hypochondriacally imagine all sorts of coming evils, because they fancy that these appearances are new, whereas they have generally existed all their lives. . . .

To this class of phenomena belong

the upper partial tones. It is not enough for the auditory nerve to have a sensation. The intellect must reflect upon it. Hence my former distinction of a material and a spiritual ear.

We always hear the tone of a string accompanied by a certain combination of upper partial tones. A different combination of such tones belongs to the tone of a flute, or of the human voices, or of a dog's howl. Whether a violin or a flute, a man or a dog is close by us is a matter of interest for us to know, and our ear takes care to distinguish the peculiarities of their tones with accuracy. The *means* by which we can distinguish them, however, is a matter of perfect indifference.

Whether the cry of the dog contains the higher octave or the twelfth of the fundamental tone, has no practical interest for us, and never occupies our attention. The upper partials are consequently thrown into that unanalyzed mass of peculiarities of a tone which we call its *quality*. Now as the existence of upper partial tones depends on the *wave form*, we see, as I was able to state previously, that the *quality of tone* corresponds to the *form of wave*.

**Hermann Ludwig Ferdinand von Helmholtz** was born August 31, 1821, at Potsdam, near Berlin, and died in Berlin September 8, 1894. He was trained as a surgeon in the Prussian army, and most of his early discoveries were in the field of physiology. At the age of 21, his first scientific paper announced the presence of nerve-cells in ganglia. The field of physics, however, soon claimed his attention, and five years later, in 1847, he read before the Physical Society of Berlin a paper on the Conservation of Force which was one of the foundation stones of that doctrine. In 1849 Helmholtz became professor of physiology at Königsberg, and in later years filled the same position at Bonn and Heidelberg. In 1851 he invented the ophthalmoscope, by which one may see the interior of the living eye. It is one of the greatest instruments of medical science. His studies on the eye appeared in 1856-66 as the *Physiological Optics*. A corresponding work on the ear, *Sensations of Tone*, appeared in 1862. Studies on electricity interested him next, and in 1871 he found that the speed of electromagnetic induction is about 314,000 meters per second. In the same year Helmholtz became professor of physics in the University of Berlin. He was then 50 years old. The remainder of his life was devoted to physical rather than physiological researches.

Science News-Letter, March 31, 1928

One pair of twins occurs in about 100 births.

Some of the most beautiful garnets come from Arizona.

# Modern Mayas Honor Their Ancestors

Archaeology

By EMMA REH STEVENSON

The present day archaeologist in Mexico is not only searching out the temples and palaces of the old Maya civilization, but he is also interested in trying to pump new courage into the descendants of the Maya Indians, by showing them the great achievements of their famous race.

This interest of the archaeologists in the modern Indians was demonstrated at the big party just given at the ruined city of Chichen Itza by the Carnegie Institution of Washington which is conducting excavations there, and by the Mexican government. The party commemorated the finishing of the Carnegie Institution's remarkable work of restoring the Temple of the Warriors at Chichen Itza. Scientists and natives joined in the fiesta. It was a great success and a good time was had by all the Maya Indians who came.

The "Warriors," as the newly restored temple is called, stands as an impressive example of what the Mayas once could do. With an old American flavor all its own, the great white structure, beautiful as any on the Greek Acropolis, stands in strange contrast today with the primitive palm-thatched Maya huts of sticks and adobe.

The restoring of the "Warriors" was not carried to completion but went as far as positive knowledge permitted in replacing the fallen stones. Parts of the groups of colonnades that flank the building on its sides have been set up again and others have been left as found to show the condition of the ruins before and after. The temple ruin now illustrates the accomplishments of the archaeologists who have resur-

rected ancient beauty out of funereal piles of carved stones.

To dedicate the restored temple natives gathered from many villages. The Maya women came in their best "huipiles" and carried their babies. The Maya men came too, in their white cotton "pajamas" and home-made sandals, and stood around. Men and women keep apart, each sex in groups.

The dress of the woman of mixed Maya and white blood, and which is also worn by the pure blooded Maya woman, is one of the most beautiful and picturesque costumes in the world. It is a dress whose style has changed very little from the costume of the Maya women before the discovery of America.

The "huipil," as it is called, is nothing but a white one-piece sleeveless overdress. The square cut neck and the bottom of the skirt are heavily embroidered in every rainbow shade of color. The dress is short and a number of fancy white petticoats show about a foot at the bottom. The women wear their hair in a "tuch" at the top of the head in the back, tied with a pretty ribbon.

The official dedication of the building of the "Warriors" to the modern descendants of the original builders, took place in front of this temple at 11 in the morning under the burning tropical sun. The roof which once capped the extensive colonnades along the sides of the temple must have offered a welcome shade to the great gatherings of Mayas held here in prehistoric times.

At two in the afternoon, the party proper started at the American hacienda, that is the headquarters of the Carnegie Expedition working at

the ruins. The "O Jarana," the typical dance of the peninsula, began to the best music in Yucatan and to the babble of the Maya tongue which seems made up of queer little stutters, sneezes and sudden gasps. The "O Jarana" is a dance that has probably changed but little since ancient times. The Maya men and women for the first time during the fiesta begin to pay some attention to each other's existence. The mute man partner touches the lady friend of his choice on the arm and they enter the ring together. They never touch one another and very rarely look at each other but begin the choppy Yucatecan jig that is similar also to the step of most Mexican religious dances.

The sex element is almost entirely lacking in this dance, and Dr. Sylvanus G. Morley, head of the Carnegie Expedition, believes that sex never did play the important part among the American Indians that it does with the white race. To the white visitors it seemed a solemn dance without happiness, for the dancers register no emotion of any kind in their faces. What emotion there was, was in the swift heels that followed the rapid time of the music perfectly.

It was "dia de fiesta" in the cluster of palm huts that have grown up about the ruins, and the element of sacrifice, so typical in ancient times, was not lacking. Dona Victoria, the dusky fat mistress of a Maya boarding house in a palm hut, sacrificed the black hog that waked up her boarders in the early morning by grunting about their hammocks.

Science News-Letter, March 31, 1928

## Evolution Since Darwin

Evolution

An example of evolutionary effects in a breed of domestic poultry originally noticed by Darwin, the white-faced Spanish fowl, has gone on evolving rapidly under the guidance of artificial selection, according to a British student of poultry, F. Finn, who writes in *Nature*. When Darwin knew the breed, Mr. Finn states, its face and the sides of its head were covered with white skin, and its earlobes were prominent and pendulous. This white skin has developed even more extensively during the half-century since Darwin called attention to the birds, and the earlobes have vanished as such, having been merged in a sort of horizontal dewlap that hangs across the cock's throat.

Science News-Letter, March 31, 1928

## Is "Coronium" Disguised Argon?

Astrophysics

Coronium, the mysterious substance in the sun's corona that only manifests itself in spectrum photographs made at the time of a total solar eclipse, is probably due to argon, third most abundant gas in the air. This has been found by researches carried on at the Ryerson Physical Laboratory of the University of Chicago, by Dr. Ira M. Freeman.

"Coronium" was first found in 1869 when, in the eclipse of that year, astronomers noticed a strange line of green color in the spectrum of the corona. This is the extremely rarefied outer layer of the sun that is visible only when the central disc of

the sun is obscured by the moon. Ever since that time physicists have been trying to find the cause of it and a group of unknown lines that were later discovered.

Dr. Freeman has found that 18 of these lines can be identified as those of the element argon, which occupies nearly one per cent. of the atmosphere. Other observations of the sun with the aid of the spectroscope have never shown the presence of argon, but, Dr. Freeman points out, it may well be that it is present but that it is quite possible the conditions on the sun are not just right for it to be in evidence ordinarily.

Science News-Letter, March 31, 1928

# How to Use Index Word Feature

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GR	Folklore.
GT	Manners and customs.
GV	Sports and amusements. Games.
HC	Economic history and conditions. National production.
HD	Economic history. Agriculture and Industries.
HE	Transportation and communication.
HF	Commerce.
HM	Sociology. General.
HQ	Family. Marriage. Woman.
HV	Social pathology.
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Q	Science. General.
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QD	Chemistry.
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QH	Natural history.
QK	Botany.
QL	Zoology.
QM	Human anatomy.
QP	Physiology.
QR	Bacteriology.
R	Medicine. General.

S	Agriculture. General.	450	Italian
SB	Field crops. Horticulture. Landscape gardening. Pests and plant diseases.	460	Spanish
SD	Forestry.	470	Latin
SF	Animal culture. Veterinary medicine.	480	Greek
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SK	Hunting. Game protection.	500	NATURAL SCIENCE—
T	Technology. General.	510	Mathematics
TA	Engineering. General.	520	Astronomy
TC	Hydraulic engineering.	530	Physics
TD	Sanitary and municipal engineering.	540	Chemistry
TE	Roads and pavements.	550	Geology
TF	Railroads.	560	Paleontology
TG	Bridges and roofs.	570	Biology
TH	Building construction.	580	Botany
TJ	Mechanical engineering.	590	Zoology
TK	Electrical engineering and industries.	600	USEFUL ARTS—
TL	Motor vehicles. Cycles. Aeronautics.	610	Medicine
TN	Mineral industries. Mining and Metallurgy.	620	Engineering
TP	Chemical technology.	630	Agriculture
TR	Photography.	640	Domestic economy
TS	Manufactures.	650	Communication. Commerce
TT	Trades.	660	Chemical technology
TX	Domestic science.	670	Manufactures
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		720	Architecture
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		780	Music
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		820	English
		830	German
		840	French
		850	Italian
		860	Spanish*
		870	Latin
		880	Greek
		890	Minor languages
		900	HISTORY—
		910	Geography and travels
		920	Biography
		930	Ancient history
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INTERNATIONAL CRITICAL TABLES: VOL. III—Edward W. Washburn—*McGraw-Hill* (\$12). In this, the third to appear of the four volumes that will complete this epoch-marking work, are included such tables as those of compressibility of liquids, densities of organic and inorganic solutions, vapor pressures, solubility of gases, boiling point elevations, and miscibility of liquids with three components. As with its two predecessors, one cannot turn its pages without admiration for the years of labor that have already been placed on it by the staff in Washington, as well as the corps of contributors throughout the world.

*Physics*

*Science News-Letter*, March 31, 1928

TWENTIETH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES—*Government Printing Office* (\$.45). The full report of the conference held last year at the Bureau of Standards on a subject that affects us all.

*Physics*

*Science News-Letter*, March 31, 1928

GENERATOR FOR AUDIO CURRENTS OF ADJUSTABLE FREQUENCY WITH PIEZO-ELECTRIC STABILIZATION—August Hund—*Government Printing Office* (\$.10). In this new Bureau of Standards scientific paper is described a beat frequency generator for producing practically sinusoidal audio currents.

*Physics*

*Science News-Letter*, March 31, 1928

ALADDIN, U. S. A.—Ernest Greenwood—*Harper* (\$.250). A popular account of the physics, engineering and economics behind the organizations that make it possible to touch a button in our homes and have light, heat, cold, power or any of the other things that electricity brings us. Thomas A. Edison contributes a brief introduction.

*Electricity*

*Science News-Letter*, March 31, 1928

A CENTURY OF INDUSTRIAL PROGRESS—Thirty contributors—*Double-day, Doran* (\$.50). As a means of commemorating a hundred years of existence, the American Institute of the City of New York has published this story of America's commerce, edited by Frederic William Wile and written by industrial leaders such as Willys, Mitchell, Straus, Schwab, Green, Hurley, Hays and others. It is worthy of a place on both your reading table and reference shelf.

*Commerce*

*Science News-Letter*, March 31, 1928

## March Pneumonia

*Hygiene*

March has the highest pneumonia death rate of any month in the year. Frequently more than one-seventh of the annual pneumonia mortality occurs in this single month, according to statistics of the Metropolitan Life Insurance Company.

A cold climate where the average humidity is not high appears to operate in favor of low mortality, a condition illustrated by the very low pneumonia rate for the western provinces of Canada. Oregon and Washington, also, have fewer pneumonia deaths than average while Pennsylvania, New York and New Jersey, in approximately the same latitude, consistently register some of the highest rates of all the states.

*Science News-Letter*, March 31, 1928

## Mexican Quake in Pacific

*Seismology*

The earthquake which was felt in a large part of Mexico during the night of Wednesday, March 21, was of unusual severity, and only the fact that it was centered in the Pacific Ocean, a hundred miles or so off the Mexican coast, prevented it from doing great damage, the U. S. Coast and Geodetic Survey announced, after a study of seismograph records gathered by Science Service.

The epicenter, or point of greatest motion of the tremor, the earthquake experts determined, was at 14 degrees north latitude and 95 degrees west longitude, and it happened at 11 hours 16 minutes and 39 seconds p. m., Eastern Standard Time.

Through Science Service, eighteen seismograph stations reported records of the quake, which, in the opinion of Commander N. H. Heck, of the Coast and Geodetic Survey, is a record for the number of stations reporting a single quake. These were at the Samoa Observatory, Apia; Univ. of Calif., Berkeley; Harvard Univ., Cambridge; Univ. of Virginia, Charlottesville; the Weather Bureau, Chicago; Regis College, Denver; the Survey's station at Honolulu; Manila Observatory, Philippine Islands; Loyola Univ., New Orleans; Fordham Univ., New York City; Dominion Obs., Ottawa; St. Louis Univ., St. Louis; Stations of the Survey at San Juan, P. R., Sitka, Alaska, and Tucson, Ariz.; The Meteorological Obs., Victoria, B. C.; and the Bureau of Standards and Georgetown University, Washington, D. C.

*Science News-Letter*, March 31, 1928

## NATURE RAMBLINGS

BY FRANK THONE

*Natural History*



### Trailing Arbutus

"My love's an arbutus," sang the Irish bard many years ago, and if the object of his adoration was a lady of sensibility (which doubtless was the case) she must have been highly pleased at the fragrance of the compliment. And even though our American arbutus is only a little plant that lives humbly close to the ground, instead of a graceful tree like the Irish species, American girls of the present generation might well be flattered if they could get their swains to sing the same words. Only the tune somehow doesn't go well on a saxophone or a ukulele.

Of all our brave array of flowers that bloom in the early spring, the trailing arbutus easily carries off the prize. Not only can it compete with the best of them in beauty of form and color, with its clusters of white and pink stars nestled down among the brown-green leaves that have sturdily withstood the winter, but it breathes a perfume that none of the other spring flowers can even feebly imitate, and which surpasses, in the judgment of many persons with discriminating nostrils, even the proud roses of the full summer-tide and the golden jasmine of the South.

Unluckily for the arbutus, its beauty surpasses its ability to defend itself, and the flower is in danger of being killed to the last sprig by lovers who can conceive of appreciation only in terms of possession. Predatory hands that gather the arbutus for the market are especially destructive, for they take all they can find and rip the plants up by the roots, careless that they are leaving a sore place on the hill-side to fester over with weeds, spoiling it even for future depredations by themselves. One who really loves flowers would no more think of buying a bunch of arbutus than he would of purchasing a dead humming-bird.

*Science News-Letter*, March 31, 1928

# The Corridors of Time

By Harold Peake, F.S.A.

*Formerly President of the Anthropological Section of the British Association.  
Author of "The Bronze Age and the Celtic World," etc.*

and Herbert John Fleure, D.Sc.

*Professor of Geography and Anthropology, University College of Wales.  
Author of "Survivals of Palaeolithic Types and Evolution  
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